

Incident Summary

Loch Eck RSZ
Boil Water Notice
21st April 2021

DWQR Inspector:
Colette Robertson-Kellie

Event No. 11996

Event Category: Significant to Serious

On the 8th August 2021 a planned repair was made to a burst 6" asbestos cement main by Scottish Water's local Framework Contractor, after Scottish Water staff had shut valves to isolate the main – this led to 19 consumer contacts reporting no water, issues with pressure, or intermittent supply, on the 8th August. There were also two calls for discoloured water on the same day, and one the following day. No samples were taken following the mains repair, in contravention of Scottish Water's Distribution, Operation and Maintenance (DOMS) procedures.

On the 10th August there was a second burst at the same location. The repair to the water main was again carried out by the Framework Contractor following its isolation by Scottish Water staff. There were 16 complaints for no water or low pressure/intermittent supply. The following morning at 08:36 there was a single contact from a consumer for discoloured water. No samples were taken following the mains repair.

A consumer who had complained of discoloured water on the 9th and 11th August again reported discoloured water on the 12th August. The following day, an NSO (Network Service Operator) attended the consumer's property, but no sample was taken. Between the 11th and 19th August, Scottish Water reported that there were a further three recorded water quality complaints from other consumers in the area.

On the 19th August, an attempt was made to install a flushing point on the water main near where the complaints were made in the Glenacre area of Innellan to clear the discolouration, but no main was located within the excavation and so the installation was postponed. The consumer who had already been in touch with Scottish Water three times about discoloured water again called on the 19th August, and then again on the 20th August. On the 24th August the consumer called Scottish Water to request that a sample be taken from their property, as they could now see black particles in their water. On the 25th August a sample was taken, and the results were made available by Scottish Water's laboratory on the 26th August. The sample failed a number of microbiological standards, with Coliform bacteria present at a concentration of 300 CFU/100 ml, E. coli at 10 CFU/100 ml, and Enterococci at 3 CFU/100ml. The plate counts were significantly elevated at 296 CFU/100 ml and 58 CFU/100 ml at 22 and 37°C. A significant quantity of 'non coliforms' were also reported from the sample. Scottish Water's Public Health Team (PHT) arranged a resample from the property on the 26th August, as well as one sample upstream and one downstream of the failing property, and they arranged for bottled water to be delivered to the failing property. They also requested information within Scottish Water on any work that had been carried out on the network in the area. The PHT then telephoned the consumer and advised them to boil their water. On the 27th August the same properties were again sampled.

The results for all samples taken on the 26th and the 27th August were made available by the laboratory on Saturday the 28th August at 10:28. All samples had failed the Coliform bacteria, E. coli and Enterococci standards, had high plate counts, and all samples contained very low levels of free chlorine. The consumers were contacted by the PHT by telephone from 10:48 and were advised to boil their water. The NSO travelled to the area to deliver boil water notices and supply bottled water to twenty properties in the area, and at 16:24 the PHT called Highland Health Board to advise them of the situation. Scottish Water advised DWQR of the situation by text at 18:36. A hydrant was installed on the 28th August in the same area that the previous hydrant installation on the 19th August had been attempted, and by 18:10 the system was being flushed. Flushing was carried out overnight, and on the morning of the 29th August the chlorine residuals had risen. On the 29th August at 09:46, the laboratory advised that four of six samples taken on the 28th August had failed microbiological standards; the boil notice was extended to a further three properties, and the Health Board was updated. Flushing of the system continued, and analysis of samples taken on the 29th August showed that the supply complied with microbiological standards, as did samples from the 30th and 31st August. On the 1st September the boil notices were lifted and the flushing points shut down. No samples were taken for laboratory analysis between the 1st and the 7th September, but chlorine residual checks on the 2nd and 3rd September showed that chlorine levels in the area were very low, so flushing of the system was restarted on the evening of the 3rd September and continued until the 21st December. Samples were taken during this period, which all passed standards, and chlorine levels were largely at more normal levels for the area.

Investigations were carried out by Scottish Water to determine the source of the contamination. On the week commencing the 1st November, Scottish Water re-excavated the location of the burst repairs from the 8th and 10th August. No obvious source of infiltration was observed, and a dye test was carried out on the adjacent sewer on the 16th November; there was no leakage of sewage evident in the excavation. On the week commencing the 16th December, excavations at the branch between the 6" main running up North Campbell Avenue and the feed into Glenacre found that the pipe feeding Glenacre had been reduced to a 3" diameter pipe via an 80mm bored plate; Scottish Water's GIS records had been incorrect. A leaking ferrule was found on the connection between the 6" main and the 3" pipe leading to Glenacre, which was immediately repaired. Hydraulic modelling of the network in the area had originally shown that the network at Glenacre would have remained under pressure during the times of the burst repairs, and as such, the focus of the investigations had been on the burst site and on the feeder pipe to Glenacre on North Campbell Road. However, following the discovery of the smaller pipe and the leaking ferrule, the hydraulic model was re-run and it became evident that the network at the branch from the 6" asbestos cement water main to Glenacre would have become depressurised during the burst repair operations, indicating that contamination could have occurred from ingress through the leaking ferrule. The supply network was reconfigured by Scottish Water with a new water main being laid to service the affected properties from a different part of the distribution system. This main was brought into service on the 13th December 2021 and the branch main that had been leaking was abandoned.

The source of contamination of the supply is likely to have been a leaking connection between the water main on North Campbell Road and the smaller branch main feeding Glenacre. Ingress of contaminated water through the leaking connection could have occurred following depressurisation of the water main on the 8th and 10th of August when scheduled repairs were made to bursts on the 6" main.

The event has been categorised as significant to serious. Scottish Water has identified eight actions which DWQR accepts are appropriate and will monitor to ensure they are completed prior to signing off the incident. DWQR made fourteen additional recommendations.

